Even though 2012 represents the first full year of operation for the Research Centre for Integrated Transport Innovation (rCITI), it seems that we have made substantial progress towards some of our major centre goals. Personally could not be happier with the support of our key university, industrial and government partners. I am also extremely proud of the performance of our staff in quickly developing new research and industrial relationships, conducting and disseminating important novel research, and working to expand our undergraduate and post-graduate teaching capability.

rCITI represents a strategic UNSW effort with research and industry partners (including NICTA and Evans & Peck) that unites and substantially augments the wide range of transport research across campus. Upon arriving at UNSW in May 2011, I was impressed with the quantity and quality of work performed in the broad Transport area on campus. The job of helping to facilitate and expand this activity is one of the key continual goals of the centre.

The official rCITI launch event took place in November and was well attended by alumni, researchers, consultants and government personnel. Speakers such as Professor Graham Davis (Dean, Faculty of Engineering), Professor Les Field (Deputy Vice-Chancellor, Research) and Mr Les Wielinga (Director General of the NSW Government Department of Transport) congratulated the University, School and Professor Waller to the opening of the rCITI, when the Centre was officially launched by Professor Mary O’Kane, NSW Chief Scientist and Engineer.

As noted in the centre launch, the mission of rCITI is to become a world-leading organization in integrated interdisciplinary transport research and development. Towards this mission, rCITI will investigate sustainable approaches to transport infrastructure and operations, with extensive liaison with industry and government. The Centre pursues these activities building on five core research pillars including Transport Planning, ITS Communications, Computational Sustainability, Infrastructure and Energy/Fuel.

The aim is to reshape the field of Multi-modal Transport Engineering and Planning by introducing new innovative techniques and technologies, which enhance society, by integrating across methodological disciplines and contextual considerations. We adopt a comprehensive system-level view facilitated by the robust interdisciplinary groups available to us at UNSW which currently span Civil, Environmental, Computer, Electrical, and Mechanical Engineering as well as the Built Environment with additional collaborations continuing to develop. Moving forward, rCITI is seeking to build new relationships with industry partners and transition core research into usable tools and solutions. Substantial scope for contribution has been identified locally, national and internationally in terms of rigorous research-based engineering tools for integrated Transport analysis.

During 2011/2012, we have been quite successful in terms of recruiting additional globally experienced Transport staff, acquiring new industrial and government funding support, expanding our PhD program and teaching curriculum, and hosting a number of visitors, seminars, and other events. However, the issue of safe, efficient, and sustainable Transport is one of society’s grandest challenges. We still have an incredibly long way to go in reaching our full potential in helping to shape the global research field of integrated Transport systems. The details of our first steps in this long journey are outlined in the following pages.
2.1 [Overview - 2011]

The Research Centre for Integrated Transport Innovation (rCITI) is a new UNSW Centre, based in the School of Civil and Environmental Engineering with activities that span the Faculty of Engineering as well as across UNSW. In the presence of supporters from Government, Industry and across the university, rCITI was officially launched in November 2011 by Professor Mary O’Kane, NSW Chief Scientist and Engineer. rCITI represents a strategic effort with research and industry partners that unites and substantially augments the wide range of transport research across campus.

The Evans & Peck Chair for Transport Innovation leads the new Research Centre and has been made possible by the generous support of Evans & Peck, an international infrastructure-based advisory company, and a School Industry Partner. Other financial supporters of the rCITI include NICTA, the units within UNSW including central strategic support as well as the Faculty of Engineering.

The new Evans & Peck Professor of Transport Innovation is Professor S. Travis Waller, previously in the Department of Civil Engineering at the University of Texas at Austin. An expert in transport systems and planning, Professor Waller also has extensive grounding in the fields of electrical and industrial engineering making him an excellent fit for the new cross-School Faculty Centre.

Professor Waller took up the position of Evans & Peck Professor for Transport Innovation and Director of rCITI in May 2011, welcomed by Dr Upali Vandebona (Senior Lecturer in Transport, School of Civil and Environmental Engineering at UNSW) and followed by Dr Lauren Gardner (Lecturer), Dr David Fajardo (Research Associate) and Dr Vinayak Dixit (Senior Lecturer).

Dr Gardner’s key areas include cross-disciplinary system interaction (e.g., health impacts of transport including disease propagation due to air travel) and congestion pricing for transportation networks. Research Associate Dr Fajardo focuses on vehicle routing, automated intersection control and logistics.

Dr Dixit, previously the Associate Director of Research, Gulf Coast Research Center for Evacuation and Transportation Resiliency at Louisiana State University, joined the team in October and has a keen interest in topics such as planning for risk in transportation and emergency evacuation and management.

Apart from the set up of the Centre structure and the official launch of the rCITI, key achievements for 2011 include the award of the UNSW Goldstar Award for “Adaptive Stochastic Network Behaviour Modeling Approaches for Representing and Responding to Disrupted Conditions” as well as a research contract with Booz Allen Hamilton for the Federal Highway Administration (FHWA) of the Department of Transport of the United States of America (USDOT). This research project represents a major FHWA initiative to investigate the “Identification and Evaluation of Transformative and Environmental Applications and Strategies”.

Professor Waller has attended and been invited to present at a variety of conferences. He spoke at ATRF in Adelaide and presented research contributions at TRB (Transportation Research Board 90th Annual Meeting, Washington D.C) and ITS (Australian Intelligent Transport Systems Summit, Gold Coast). In addition, Professor Waller has co-organized and co-chaired a Panel at ISGT for IEEE (Innovative Smart Grid Technologies Conference, Perth) about the rising popularity of Electric Vehicles and this growing interdisciplinary field. He also co-organized a workshop on micro-simulation in Melbourne and presented at an international workshop on traffic management hosted by QUT.

Resulting from rapidly increasing interest on electric vehicles, The University of New South Wales hosted an introductory workshop in November on “The Convergence of Transportation, Energy, and the Built Environment”. Lead by Professor Waller and Professor Michael Neuman (Professor of Sustainable Urbanism, Faculty of the Built Environment), key speakers included Professor Mladen Kezunovic (Director, Power System Control and Protection Laboratory, Texas A & M University), Professor Michael A P Taylor (Professor of Transport Planning, University of South Australia), Dr Peter Pudney (Senior Research Fellow, University of South Australia), Mr
Kristian Handberg (Project Manager, VIC Department of Transport), Mr Ricardo Goldman (Managing Director at TRIM GBO, Architecture and Planning, Spain) and Mr Guy Pross (Director, Business Development and Commercial Partnerships, Better Place). Additional attendees included representation from national labs, consultancies and government. The focus of this workshop was an overview of previous international research and deployment efforts, the exploration of domain linkages, and the potential for collaboration in this growing interdisciplinary field. The intention is to hold further workshops in the future and outline possible areas for collaboration.

2.2 [Overview – 2012]

Since its launch in November 2011, rCITI has continued to expand and strengthen its network across campus and with relevant government and industry. Key achievements for 2012 include the signing of an Umbrella Deed with the NSW Government Roads and Maritime Services (RMS), as well as a Memorandum of Understanding with GoGet, the car share company and Better Place, an electric car charge network; and the award of a 2013 Australian Research Council (ARC) Linkage Infrastructure, Equipment and Facilities (LIEF) Grant for a world-first driving simulation laboratory.

The NSW Minister for Transport, The Hon. Gladys Berejiklian visited the School of Civil and Environmental Engineering in March 2012 for a presentation about the Research Centre for Integrated Transport Innovation (rCITI). Professor Travis Waller’s overview of rCITI was followed by discussion with the Minister. Attendees at the Minister’s visit included delegates from UNSW such as Professor Graham Davies (Dean, Faculty of Engineering), Professor Les Field (Deputy Vice-Chancellor, Research), Professor T. David Waite (HoS, Civil and Environmental Engineering), and Professor Nasser Khalili (Associate Dean, Research), as well as representatives from Evans & Peck (Mr Ian McIntyre and Mr Paul Forward, Principals).
and NICTA (Mr Rob Fitzpatrick, Director, Infrastructure, Transport & Logistics). During her visit, Ms Berejiklian appointed Professor Waller an invited member to the Transport Specialist Advisory Group for Transport for NSW.

rCITI staff held numerous other governmental meetings in 2012, including with Mr Mike Mrdak, Secretary at the Department of Infrastructure, Transport, Regional Development & Local Government who invited Professor Waller for discussions with him and his team to Canberra.

Professor Waller and Dr. Dixit from rCITI, Professor Dennis Del Favero, Director of the UNSW iCinema Research Centre for Interactive Cinema, jointly with Professor Bliemer from the University of Sydney, were awarded a 2013 Australian Research Council (ARC) Linkage Infrastructure, Equipment and Facilities (LIEF) for a driving simulation laboratory, the Travel Choice Simulation Laboratory (TRACSLab). TRACSLab is a world-first facility to observe collective travel choice in a realistic lab environment. It is unique due to the focus on travel choice, networked interaction and strong teaming. The findings of the lab will support a new generation of transport analysis techniques for emerging issues such as sustainability, reliability, and ITS.

rCITI lead an international consortium (including Monash, IIT Delhi, IIT Madras, NICTA, DIMTS, CRRI and GoGet) for an expression-of-interest (EOI) submission on “Integrated Network Planning Methodologies for the Sustainable Convergence of Transport and Energy”, to the Australian Government Department of Industry, Innovation Science, Research and Tertiary Education for the Australia-India Strategic Research Fund (AISRF) Grand Challenge. The EOI was successful in the pre-proposal stage and the team was invited to submit a full application. The outcome will be announced in 2013.

Dr. Lavy Libman joined the School of Computer Science and Engineering at UNSW as a Senior Lecturer in March 2012. Dr. Libman was previously a Senior Lecturer at the School of Information Technologies at the University of Sydney.
of Sydney as well as a Researcher at NICTA’s Networks Research Group. His primary research interests lie in cross-layer performance optimization of wireless networks as well as the applications of game theory to networks and distributed systems. Dr. Libman forms part of the core Academic staff at rCITI.

In October, Dr. Taha Hossein Rashidi from the University of Toronto, Canada, joined the Centre’s core academic team and was welcomed by Centre Director Professor S. Travis Waller, Senior Lecturer Dr. Upali Vandebona, Senior Lecturer Dr. Vinayak Dixit, Senior Lecturer Lavy Libman (Computer Science and Engineering) and Lecturer Dr. Lauren Gardner. Dr. Rashidi’s research expertise complements rCITI’s research efforts in key areas, including land-use and vehicle ownership models, as well as goods movement data collection and modelling methods.

At the same time, Visiting Fellow Dr. Hironobu Hasegawa joined the transportation group from the Akita National College of Technology. Dr. Hasegawa will work with rCITI on a variety of research areas, including his key expertise in applications of machine learning and data mining algorithms in the field of transportation. In particular, he is currently collaborating on the development of a micro-simulation travel demand model for the City of Melbourne.

Professor Waller and other rCITI staff have attended and been invited to present at a variety of conferences this year. Many rCITI staff participated in TRB (Transportation Research Board 91st Annual Meeting, Washington D.C.), presenting research contributions and chairing several TRB Committee Meetings. In addition, Prof. Waller gave an invited talk at the Intelligent Transport Systems (ITS) Workshop at Beijing Jiaotong University in May and was a plenary speaker at the 17th International Conference of the Hong Kong Society for Transportation Studies (HKSTS) in Hong Kong in December.

The 4th International Symposium on Dynamic Traffic Assignment (DTA) took place on Martha’s Vineyard in June and was co-organized by Professor Waller, who also presented new developments in the field of DTA including better methods for addressing day-to-day volatility in traffic flow within the transport planning process.

In December, Professor Waller was invited to Japan to participate in an exclusive meeting of the National Institute of Informatics (NII) on “Social Issues in Computational Transportation Science”. The meeting consisted of research leaders spanning computer science, big data, transport engineering, and urban planning with the aim of identifying emerging themes and cutting-edge concepts which impact numerous adjacent domains.

Further, Prof. Waller received the 2011 (awarded in 2012) Hojjat Adeli Award for Innovation in Computing. The award is based on published research within the journal Computer Aided Civil and Infrastructure Engineering (CACAIE), which is ranked as the top journal in Civil Engineering as well as Transportation Science & Technology (ranked by journal citation factor).

Throughout the year, rCITI has also attracted and welcomed a variety of guest speakers to the School for relevant research seminars. Visitors and seminar topics included Associate Professor Karen Smilowitz of the Department of Industrial Engineering and Management Sciences at Northwestern University (“Transportation and logistics models in non-profit settings”), Professor Lisa Rutstrom from Georgia State University (“Experiments on Driving Under Uncertain Congestion Conditions”), Dr. Majid Sarvi from the Civil Engineering Department at Monash University (“Crowd Safety under Panic Conditions: Linking Non-human Biological Organisms to the Development of a Crowd Dynamic Model”), Associate Professor Satish Ukkusuri from Purdue University (“Integrative Modeling Tools for Sustainable Transportation Systems” and “The Use of Large Scale Geo-Location Data for Traffic Analytics”), as well as Professor Sahotra Sarkar from the Section of Integrative Biology at the University of Texas at Austin (“Climate Change and the Risk of Vector-Borne Diseases”).

It has been a successful year for rCITI in expanding and strengthening key relations and commencing new research projects. In fact, even though 2012 represents the first full year of operation for the transport centre, rCITI has already developed multiple key relationships with industry, attracted global attention for research performed at UNSW, worked on internationally funded projects, led global consortia, received substantial funding from the Australian Research Council and built a world-class staff of researchers and educators.
rCITI is to become a world-leading organization in integrated interdisciplinary transport research and development. Towards this mission, rCITI will investigate sustainable approaches to transport infrastructure and operations, with extensive liaison with industry and government. The Centre pursues these activities building on five core research pillars including Transport Planning, ITS Communications, Computational Sustainability, Infrastructure and Energy / Fuel.
### 3.2 [Staff]

**Core Centre Staff – 2012**

**DIRECTOR**
Professor S. Travis Waller, Evans & Peck Professor of Transport Innovation

**DEPUTY DIRECTOR**
Dr Vinayak Dixit, Senior Lecturer

**ACADEMICS**
Dr Upali Vandebona, Senior Lecturer
Dr Lavy Libman, Senior Lecturer (Computer Science and Engineering)
Dr Lauren Gardner, Lecturer

**RESEARCHERS**
Dr David Fajardo, Research Associate
Dr Taha Hossein Rashidi, Research Fellow

**CENTRE MANAGER**
Sylvia Brohl

**Adjunct & Visiting Academic Staff**
Dr Hironobu Hasegawa, PhD Muroran IT, Japan, Visiting Fellow
Akita National College of Technology, Japan

Dr Peter Hidas, MEng Dip TP, PhD Budapest, Visiting Fellow
Transport for New South Wales, Bureau of Transport Statistics (BTS)

### 3.3 [Steering Committee]

**rCITI Steering Committee**

Professor Graham Davies
Dean, Faculty of Engineering

Professor Nasser Khalili
Associate Dean (Research), Faculty of Engineering

Professor T. David Waite
Head of School, Civil and Environmental Engineering

Professor S. Travis Waller
Evans & Peck Professor of Transport Innovation and Director, Research Centre for Integrated Transport Innovation (rCITI)

Associate Professor Maurice Pagnucco
Head of School, Computer Science and Engineering

Mr Ian McIntyre
Principal, Evans & Peck

Mr Rob Fitzpatrick
Director, Infrastructure, Transport & Logistics, NICTA

Dr Glenn Geers
Technology Director, Infrastructure, Transport & Logistics, NICTA
3.4 [Research Interests]

S. Travis Waller
Evans & Peck Professor of Transport Innovation and Director, rCITI
BSc Ohio State, MSc, PhD Northwestern

Research Interests:
Transportation network modelling, particularly systems characterized by dynamics, uncertainty and information; large-scale integrated transport optimization and planning. Specific applications or problem domains include Dynamic Traffic Assignment (DTA), routing algorithm development, network equilibrium, stochastic optimization, integrated demand/supply modelling, network design, adaptive equilibrium, system analysis of public-private partnerships, and bi-level optimization of transport networks.

Teaching Areas/Interests:
Transport Network Modelling
Integrated System Analysis
Optimization
Simulation
Intelligent Transportation Systems

Upali Vandebona
Senior Lecturer
BSc (Eng) Ceylon, MEng AIT, PhD Monash

Research Interests:

Teaching Areas/Interests:
Transport systems and operations design
Traffic engineering
Transport planning, transport infrastructure development, transport economics and environmental assessments
Highway Engineering

Vinayak Dixit
Senior Lecturer and Deputy Director, rCITI
MT Institute of Technology, Delhi, PhD University of Central Florida

Research Interests:

Teaching Areas/Interests:
Transportation Modelling and Simulation
Transportation Management and Control
Traffic Flow Theory
Traffic Engineering

Lavy Libman
Senior Lecturer
BSc, MSC, PhD Technion, Israel Institute of Technology

Research Interests:
Cross-layer performance optimization of wireless networks: Cooperative and opportunistic retransmission and routing strategies; Error control and failure recovery methods; Wireless network coding; Protocols for devices with limited energy, memory, and computational power resources; Protocols for networks with highly dynamic topologies (e.g. vehicular networks)
Applications of game theory to networks and distributed systems: Pricing and market-based schemes for distributed resource allocation and optimization; Analysis, design and optimization of autonomous networks; Distributed detection of network equilibria and violations thereof (e.g. incident detection in transportation networks)

Teaching Area/Interest: Wireless Communication
Lauren Gardner
Lecturer
BS ArchE, MSE, PhD, University of Texas at Austin

Research Interests:
Network modelling for multi-domain integrated systems: congestion pricing models accounting for uncertainty, the role of real-time information and adaptive pricing; Sustainability models integrating transportation and electricity systems: developing network-based optimization models to predict the role of global transport systems in the spread of contagious disease.

Teaching Areas/Interests:
Computational Sustainability
Urban Transportation Planning
Congestion Pricing and Economics

David Fajardo
Research Associate
BSE, MSE, PhD, University of Texas at Austin

Research Interests:
Network Optimization; Facility Location Modeling; Stochastic Routing; Equilibrium with Recourse

Teaching Areas/Interests:
Transport System Optimization
Logistics

Taha Hossein Rashidi
Research Fellow
BSc MSc, Sharif UT Tehran, PhD, UI Chicago

Research Interests:
Travel Behavior Analysis; Transportation Planning; Activity-Based Travel Demand Modeling; Housing Search and Land Use Modelling; Integrated Land-Use and Transportation Models; Goods Movement Modelling; Microsimulation Modeling Methods for Urban Activities

Teaching Areas/Interests:
Applied Econometrics and Statistics in Transport Modelling
Travel Demand and Land Use Modelling
Planning Sustainable Infrastructure
**Book Chapter**


**Journal - Refereed & Scholarly Article**


Conference - Full Paper Refereed


Conference – Full Paper, Not Refereed


Conference – Full Paper, Not Refereed


## 3.6 [Visitors, Seminars & Workshops]

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<tr>
<th>Date</th>
<th>Host/Organizer</th>
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<th>Title/Position</th>
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<tbody>
<tr>
<td>19-April-2012</td>
<td>rCITI</td>
<td>A/Prof. Karen Smilowitz</td>
<td>Junior William A. Patterson Chair in Transportation</td>
<td>Department of Industrial Engineering and Management Sciences, Northwestern University</td>
<td>Transportation and logistics models in non-profit settings</td>
</tr>
<tr>
<td>22-June-2012</td>
<td>rCITI / CEEM (Centre for Energy and Environmental Markets, UNSW)</td>
<td>Dr. Amela Ajanovic</td>
<td>Senior Research Scientist</td>
<td>Vienna University of Technology</td>
<td>Deriving Least-Cost Policy Strategies for Meeting CO2-Reduction Targets in Passenger Car Transport in the EU-15</td>
</tr>
<tr>
<td>29-May-2012</td>
<td>rCITI</td>
<td>Prof. Lisa Rutstrom</td>
<td>Professor at Robinson College of Business and Andrew Young School's Department of Economics</td>
<td>Georgia State University</td>
<td>Experiments on Driving Under Uncertain Congestion Conditions</td>
</tr>
<tr>
<td>31-May-2012</td>
<td>rCITI</td>
<td>Dr. Majid Sarvi</td>
<td>Senior Lecturer</td>
<td>Civil Engineering, Monash University</td>
<td>Crowd Safety under Panic Conditions: Linking Non-human Biological Organisms to the Development of a Crowd Dynamic Model</td>
</tr>
<tr>
<td>20-Sept-2012</td>
<td>rCITI</td>
<td>A/Prof. Satish Ukkusuri</td>
<td>Associate Professor and Director, Interdisciplinary Transportation Modeling and Analytics Lab</td>
<td>Purdue University</td>
<td>Integrative Modeling Tools for Sustainable Transportation Systems</td>
</tr>
<tr>
<td>4-Oct-2012</td>
<td>rCITI</td>
<td>A/Prof. Satish Ukkusuri</td>
<td>Associate Professor and Director, Interdisciplinary Transportation Modeling and Analytics Lab</td>
<td>Purdue University</td>
<td>The Use of Large Scale Geo-Location Data for Traffic Analytics</td>
</tr>
<tr>
<td>11-Dec-2012</td>
<td>rCITI</td>
<td>Prof. Sahotra Sarkar</td>
<td>Professor of Philosophy and Integrative Biology</td>
<td>University of Texas at Austin</td>
<td>Climate Change and the Risk of Vector-Borne Diseases</td>
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<tr>
<td>Date</td>
<td>Organizer</td>
<td>Topic</td>
<td>Speakers</td>
<td>Additional Attendees</td>
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| 25-Nov-2011  | Prof. S.T. Waller (rCITI) and Prof. M. Neuman (BE) | The Convergence of Transportation, Energy, and the Built Environment | • Professor Mladen Kezunovic (Director, Power System Control and Protection Laboratory, Texas A & M University),  
• Professor Michael A P Taylor (Professor of Transport Planning, University of South Australia),  
• Dr Peter Pudney (Senior Research Fellow, University of South Australia),  
• Mr Kristian Handberg (Project Manager, VIC Department of Transport),  
• Mr Ricardo Goldman (Managing Director at TRIM GBO, Architecture and Planning, Spain),  
• Mr Guy Pross (Director, Business Development and Commercial Partnerships, Better Place) | • Paul Davies, Manager Environment Policy, SA Department of Planning, Transport and Infrastructure  
• Penny Golding, Manager Policy, Planning Systems & Reform, NSW Department of Planning and Infrastructure  
• Andrew Mckindlay, Operations Manager & Principal, Evans & Peck  
• Glenn Geers, Director, Intelligent Transport Systems Technologies, NICTA  
• Charles Gretton, Researcher, NICTA  
• Iain MacGill, Joint Director (Engineering), Centre for Energy and Environmental Markets (CEEM), UNSW  
• Upali Vandebona, Senior Lecturer, CVEN  
• Vinayak Dixit, Senior Lecturer, CVEN  
• Lauren Gardner, Lecturer, CVEN  
• Melissa Duell, PhD Student CVEN  
• Graham Mills, PhD Student EET |
Ricardo Goldman, Prof. Michael Neuman (Built Environment)

EV Workshop
25 November 2011

Left: Prof. S. Travis Waller
Below: Prof. Mladen Kezunovic, Group Discussions
**GoGet MoU**

GoGet and rCITI signed a memorandum of understanding to be able to freely share data and research. This memorandum of understanding has opened up opportunities on conducting behavioural research on safety and route choice, autonomous driving and development of efficient carshare systems.

**ARC LIEF Grant**

The research team led by rCITI won an Australian Research Council grant for Linkage Infrastructure, Equipment and Facilities to deploy a Travel Choice Simulation Laboratory (TRACSLab), which is a world-first facility to observe collective travel choice in a realistic lab environment. It is unique due to the focus on travel choice, networked interaction and strong teaming (including our partners at the University of Sydney and iCinema). The findings of the lab will support a new generation of transport analysis techniques for emerging issues such as sustainability, reliability, and intelligent transport systems (ITS).

**Visit of the NSW Minister for Transport, The Hon. Gladys Berejiklian and Appointment to TfNSW Specialist Advisory Group**

The NSW Minister for Transport, The Hon. Gladys Berejiklian visited the School of Civil and Environmental Engineering in March 2012 for a presentation about the Research Centre for Integrated Transport Innovation (rCITI). Professor Travis Waller’s overview of rCITI was followed by discussion with the Minister. Attendees at the Minister’s visit included delegates from UNSW such as Professor Graham Davies (Dean, Faculty of Engineering), Professor Les Field (Deputy Vice-Chancellor, Research), Professor T. David Waite (HoS, Civil and Environmental Engineering), and Professor Nasser Khalili (Associate Dean, Research), as well as representatives from Evans & Peck (Mr Ian McIntyre and Mr Paul Forward, Principals) and NICTA (Mr Rob Fitzpatrick, Director, Infrastructure, Transport & Logistics). During her visit, Ms Berejiklian appointed Professor Waller an invited member to the Transport Specialist Advisory Group for Transport for NSW.

**School of Civil Engineering External Relations Committee**

Dr Lauren Gardner is a member of the School’s External Relations Committee, along with committee members Associate Professor Ron Cox, Dr Kurt Douglas, Dr Steve Davis, Dr Mary O’Connell, Dr Hazel Rowley and Ms Patricia Tesoriero.

In 2012, this group won the UNSW Staff Excellence Award (Group) for Excellence in Community Engagement. The HoS nomination noted that the ERC has been outstanding in their dedication, motivation and professionalism in carrying out the committee’s objectives of developing effective outreach and marketing programs as well as building and maintaining mutually beneficial relationships with industry partners and supporters, ex-staff and alumni.

**U.S. Department of Transportation Project**

In 2012, rCITI was part of an international team that won a $1.3M project from the Federal Highway Administration (FHWA) of the United States Department of Transportation (US DOT). The team consisted of Booz Allen Hamilton (lead), rCITI, University of California Riverside and the University of Arizona. This research project represents a major FHWA initiative to investigate the “Identification and Evaluation of Transformative and Environmental Applications and Strategies”. rCITI is leading the network modelling component of the research (total rCITI budget of approximately $275K) and will develop novel network evaluation methodologies for active traffic management where environmental impact is the primary issue.
Faculty Research Grants:

Dr Lauren Gardner:

“Quantifying the Role of International Transport Network Connectivity in Modeling Australian Epidemiological Risk via Passenger Travel and Freight Importation”, UNSW Faculty Research Grant, awarded 2011.

The number of travel-acquired arboviral infections has been on a constant rise in Australia over the past decade. This proposal describes a preliminary model that quantifies the relative risk of importing travel-acquired arboviral infections into non-endemic regions via international air travel routes. An extension of the model is proposed that will identify high risk routes entering Australia, and include various modes of international transport. The model results can be used to identify optimal locations (airports, sea ports, etc.) for surveillance.

“Quantifying the Spatiotemporal Energy Consumption Patterns and of Electric Vehicles in Regional Transport Networks”, UNSW Faculty Research Grant, awarded 2012.

Future potential plug-in electric vehicle (PEV) usage requires that long-term transportation planning models expand to explicitly account for relevant system impacts. Further, due to the uncertain nature of PEV adoption as well as their cross-cutting characteristics, there is an increased need for new techniques and insights related to travel demand uncertainty, and resulting variability in energy consumption and environmental impact. This work will address these items by developing an evaluation framework and examining multiple performance measures (e.g., travel time, energy consumption) regarding the integration of PEVs into the transport system through the use of dynamic traffic assignment modelling tools.

Dr Vinayak Dixit:

“Experimental Economic Methods to Evaluate Impact of Risk Aversion and Subjective Beliefs on Route Choice”, UNSW Faculty Research Grant, awarded 2011. This research seeded the successful ARC LIEF grant. As part of this research new methods were developed to elicit risk attitudes and beliefs, as well as new equilibrium models to predict reliability in networks.
<table>
<thead>
<tr>
<th>PhD</th>
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<tr>
<td><strong>Melissa Duell</strong> – Strategic traffic assignment: methods of modelling day-to-day flow volatility (ST Waller, L Gardner)</td>
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<tr>
<td><strong>Md Kamrul Islam</strong> – Stochastic Modelling for Evaluation of Impacts of Headway Variability on Public Transit Performan (U Vandebona, V Dixit, ASharma)</td>
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<tr>
<td><strong>Mojtaba Maghrebi</strong> – Performance assessment of process based planning and control in construction (ST Waller, C Sammut)</td>
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<tr>
<td><strong>Bipul Sen (CSE)</strong> – Exploiting MAC-layer Cooperative Retransmission in Wireless Mesh Networks (S Jha, L Libman)</td>
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<tr>
<td><strong>Kasun Wijayaratna</strong> – Modelling the reliability of transport network (ST Waller, V Dixit)</td>
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<th>Masters by Research</th>
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<tr>
<td><strong>Tao Wen</strong> (ST Waller, L Gardner)</td>
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<td><strong>Asif Hassan</strong> (V Dixit)</td>
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<th>Honours Students</th>
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<tbody>
<tr>
<td><strong>Jennifer Drummond</strong> – Analysis of Rail Infrastructure Projects to Reduce Passenger Delay (ST Waller, L Gardner)</td>
</tr>
<tr>
<td><strong>Geethaka Fernando</strong> – Parking Advisory Systems (U Vandebona)</td>
</tr>
<tr>
<td><strong>Kristian Miller</strong> – The Realignment of the Tarana Section of the NSW Main Western Railway Line (U Vandebona)</td>
</tr>
<tr>
<td><strong>Asith Nagodavithane</strong> – Design Proposal of Economical Integrated Bus Systems to Improve Sydney’s Public Transport and Roads (U Vandebona)</td>
</tr>
<tr>
<td><strong>Edward Robson</strong> – Consumer Benefit Model for Developing Public Transport Networks (U Vandebona)</td>
</tr>
<tr>
<td><strong>Kian Seng Tay</strong> – Evaluation of Roundabout Capacity using the Average Circulating Flow (V Dixit)</td>
</tr>
<tr>
<td><strong>Veronica Ung</strong> – Reliability and On-Time Performance of Buses in Sydney (U Vandebona)</td>
</tr>
<tr>
<td><strong>Peter Waddington</strong> – Spatial Modelling of Electric Vehicle Uptake in the Greater Sydney Area (ST Waller, L Gardner)</td>
</tr>
<tr>
<td><strong>Manod Wickramasinghe</strong> – Emergency Transport Systems in the Balmain Peninsula (U Vandebona)</td>
</tr>
<tr>
<td><strong>Tianqi Zhai</strong> – Randwick Hospitals Travel Characteristics and Car Parking Demand Study - A Project Case Study (ST Waller, V Dixit)</td>
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<tr>
<th>Taste of Research (ToR)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stanley He</strong> (ST Waller, L Libman)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Master of Philosophy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tahir Mehmood (CSE)</strong> – Optimal forwarding in wireless networks: opportunistic network coding (S Jha, L Libman)</td>
</tr>
<tr>
<td>Senior Investigator(s) / Researcher(s)</td>
</tr>
<tr>
<td>---------------------------------------</td>
</tr>
<tr>
<td>Prof. S. Travis Waller</td>
</tr>
<tr>
<td>Dr. Vinayak Dixit</td>
</tr>
<tr>
<td>Dr. Lauren Gardner</td>
</tr>
<tr>
<td>Prof. S. Travis Waller</td>
</tr>
<tr>
<td>Dr. Lauren Gardner</td>
</tr>
<tr>
<td>Prof. S. Travis Waller, Dr. Vinayak Dixit, Prof. Michiel Bliemer (USyd) and Prof. Dennis Del Favero</td>
</tr>
</tbody>
</table>
### Statement of Financial Performance for the Year Ending 31 December 2012

<table>
<thead>
<tr>
<th>Notes</th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Funds</strong></td>
<td></td>
</tr>
<tr>
<td>External Research Funds</td>
<td>1</td>
</tr>
<tr>
<td>Faculty Research Grants</td>
<td>35,002.00</td>
</tr>
<tr>
<td>UNSW Strategic Funds</td>
<td>2*</td>
</tr>
<tr>
<td><strong>Total Funds</strong> **</td>
<td>367,293.00</td>
</tr>
<tr>
<td><strong>Costs</strong></td>
<td></td>
</tr>
<tr>
<td>Personnel Costs</td>
<td>258,136.00</td>
</tr>
<tr>
<td>Materials and Maintenance</td>
<td>14,462.00</td>
</tr>
<tr>
<td>Travel incl. Visitors, Speakers</td>
<td>80,782.00</td>
</tr>
<tr>
<td>Equipment</td>
<td>4,635.00</td>
</tr>
<tr>
<td>Other Non-People Cost</td>
<td>3,124.00</td>
</tr>
<tr>
<td>Internal Expense (Overhead)</td>
<td>6,154.00</td>
</tr>
<tr>
<td><strong>Total Costs</strong> **</td>
<td>367,293.00</td>
</tr>
<tr>
<td>Operating Result **</td>
<td>*</td>
</tr>
<tr>
<td>Operating Balance</td>
<td>0.00</td>
</tr>
<tr>
<td>Closing Balance **</td>
<td>*</td>
</tr>
</tbody>
</table>

### Notes to the Statement of Financial Performance

1. rCITI was awarded External NICTA Research Funds of $165,028 for salary contributions L. Gardner (CVEN) and L. Libman (CSE) as well as PhD Student Scholarship M. Duell. Due to the UNSW structure these funds are reflected under Department IDs CVEN and CSE and appear on the respective School Financial Statement.

2. 2012 Gold Star UNSW Competitive Grant ($40,000); Salary Contributions L. Gardner and S.T. Waller; Centre Strategic Funds. * Remaining Centre Strategic Funds will be re-allocated in 2014.

**CVEN School Salary Contributions are excluded from this statement as these appear on the School Financial Statement.
rCITI 2011 Group
(left to right) Melissa Duell (PhD Student), Vinayak Dixit (Senior Lecturer), S. Travis Waller (Director, rCITI), David Fajardo (Research Associate), Sylvia Brohl (Centre Officer), Lauren Gardner (Lecturer), Upali Vandebona (Senior Lecturer)